

SEQUENCE LISTING

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 Jarrett, Paul
 Ellis, Debbie
 Ousley, Margaret Anne

<120> BIOLOGICAL CONTROL OF NEMATODES

<130> 13384-002001

<140> 09/889,874

<141> 2001-07-23

<150> PCT/GB00/00219

<151> 2000-01-24

<150> GB 9901499.5

<151> 1999-01-22

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<170> FastSEQ for Windows Version 4.0

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<213> Xenorhabdus bovienii

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Arg	Phe	Thr	His	Phe	Asp	Pro	Asp	Lys	Glu	Gln	Asp	Val	Thr	Leu	Val
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Pro	Ser	Thr	Glu	Glu	Ala	Tyr	Trp	Leu	His	Arg	Ala	Leu	Gln	Gly	Gln
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Pro	Leu	His	Ser	Glu	Val	Tyr	Gly	Asp	Asp	Gly	Thr	Ala	Gln	Ala	Gly
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Ile	Pro	Tyr	Thr	Val	Met	Asp	Ser	Arg	Pro	Gln	Val	Arg	Leu	Leu	Thr
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Gly	Leu	Pro	Gly	Asn	Ser	Pro	Thr	Val	Trp	Pro	Ser	Val	Ile	Glu	Gln
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Arg	Thr	Trp	Gln	Tyr	Glu	Arg	Ile	Ala	Asp	Asp	Pro	Gln	Cys	His	Gln
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Gln	Val	Val	Leu	Asn	Ser	Asp	Arg	Tyr	Gly	Phe	Pro	Arg	Glu	Thr	Val
		130				135					140				
Asp	Ile	Ala	Tyr	Pro	Arg	Arg	Pro	Lys	Pro	Ala	Val	Ser	Pro	Tyr	Pro
145					150					155				160	
Asp	Thr	Leu	Pro	Ala	Thr	Leu	Phe	Asp	Ser	Ser	Tyr	Asp	Glu	Gln	Gln
			165					170						175	
Gln	Gln	Leu	Arg	Leu	Thr	Arg	Gln	Arg	Gln	His	Tyr	His	His	Leu	Thr
		180					185						190		
Asp	Thr	Glu	His	Gln	Val	Leu	Gly	Leu	Pro	Asp	Val	Met	Arg	Ser	Asp

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Ala 210	Trp 210	Gly	Tyr	Pro	Ala 215	Ala 215	Arg	Val	Pro	Arg	Glu 220	Gly	Phe	Thr	Leu 225	
Glu 225	Asp	Leu	Leu	Ala 230	Glu 230	Asn	Ser	Leu	Ile	Ala 235	Pro	Gly	Thr	Pro	Leu 240	
Thr	Tyr	Leu	Gly	His 245	Gln	Arg	Val	Ala 250	Tyr	Thr	Gly	Thr	Thr	Gly	Thr 255	
Glu	Glu	Lys	Pro	Thr 260	Arg	Gln	Ala 265	Leu	Val	Ala	Tyr	Thr	Glu	Thr	Ala 270	
Val	Phe	Asp 275	Glu	Leu	Ala	Leu	Gln 280	Ala	Phe	Asn	Gly	Thr 285	Leu	Ser	Pro	
Glu	Ala 290	Leu	Glu	Lys	Lys	Leu 295	Ile	Glu	Ser	Gly	Tyr 300	Leu	Ser	Val	Pro	
Arg 305	Pro	Phe	Asn	Thr	Gly 310	Ala	Glu	Ser	Ala	Val	Trp	Val	Ala	Arg	Gln 320	
Gly	Tyr	Thr	Asp	Tyr 325	Gly	Gly	Ser	Glu	Ala	Phe	Tyr	Arg	Pro	Leu	Ala 335	
Gln	Arg	Thr	Thr	Val 340	Gln	Ile	Gly	Lys	Asn	Thr	Leu	His	Trp	Asp	Thr 350	
His	Tyr	Cys 355	Ala	Val	Val	Arg	Met 360	Gln	Asp	Ala	Ala	Gly	Leu	Tyr	Thr 365	
Asp	Ala 370	Ala	Tyr	Asp	Tyr	Arg	Phe 375	Leu	Thr	Pro	Val	Gln	Ile	Thr	Asp 380	
Ala 385	Asn	Asp	Asn	Gln	Gln 390	His	Ile	Thr	Leu	Thr	Ala	Leu	Gly	Gln	Val 400	
Ser	Ser	Gly	Arg	Phe 405	Trp	Gly	Thr	Glu	Glu	Gly	Thr	Pro	Gln	Gly	Tyr 415	
Thr	Pro	Pro	Glu	Asp 420	Arg	Pro	Phe	Thr	Pro	Pro	Ser	Ser	Val	Ala	Glu 430	
Ala	Leu	Asp 435	Leu	Lys	Pro	Asp	Leu	Pro	Val	Ala	Asn	Cys	Met	Val	Tyr 445	
Ala	Pro	Leu	Ser	Trp	Met	Pro	Leu	Ala	His	Thr	Tyr	Gln	Glu	Tyr	Ile 455	
Ala 465	Gly	Phe	Thr	Trp	Gln	Ala	Leu	Leu	Asp	Ala	Gly	Val	Val	Thr	Glu 480	
Asp	Lys	Arg	Val	Cys 485	Ala	Leu	Gly	Phe	Arg	Arg	Trp	Val	Gln	Arg	Gln 495	
Gly	Ile	Val	Leu	Asn 500	Gly	Gln	Ala	Leu	Ala	Asp	Ser	Arg	Glu	Pro	Val 510	
His	Val	Leu	Thr	Leu	Ala	Thr	Asp	Arg	Tyr	Asp	Thr	Asp	Pro	Asp	Gln 525	
Gln	Leu	Arg	Lys	Ser	Val	Thr	Tyr	Ser	Asp	Gly	Phe	Gly	Arg	Leu	Leu 540	
Gln 545	Ser	Ala	Val	Tyr	His	Ala	Pro	Gly	Glu	Ala	Trp	Gln	Arg	Ala	Ala 560	
Asp	Gly	Ser	Leu	Ile	Thr	Asp	Ala	Lys	Gly	Ala	Pro	Leu	Val	Ala	His 575	
Thr	Ala	Thr	Arg	Trp	Ala	Val	Ser	Gly	Arg	Thr	Glu	Tyr	Asp	Gly	Lys 590	
Gly	Gln	Pro	Val	Arg	Thr	Tyr	Pro	Pro	Phe	Phe	Leu	Asn	Ala	Trp	Gln 605	
Tyr	Leu	Ser	Asp	Asp	Ser	Ala	Arg	Gln	Asp	Leu	Asn	Ala	Asp	Thr	His 620	
Arg	Tyr	Asp	Pro	Leu	Gly	Arg	Glu	Tyr	Gln	Val	Arg	Thr	Ala	Lys	Gly 640	
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Glu Asn Asp Thr Leu Ser
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<213> Xenorhabdus bovienii

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Ile Gly Tyr Leu Asn Gly Gly Gln Glu Ala Val Ile Ile Gly Gly Ile
20 25 30
Arg Val Gln Thr Arg Arg Ile Leu His Thr Asp Asp Arg Thr Val Met
35 40 45
Gly Ile Pro Met Glu Gly Val Phe Ala Asn Leu His Arg Arg Pro Leu
50 55 60
Ser Gln Arg Thr Val Lys Arg Leu Arg Pro Ala Val Ile Gly Ile Ser
65 70 75 80
Leu Thr Gly Asp Pro Asp Arg Arg Phe Arg Thr Gly Ile Glu Trp Ala
85 90 95
Trp Asn Arg Gln Ile Thr Arg Leu Asp
100 105

<210> 3
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<213> Xenorhabdus bovienii

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1 5 10 15
Lys Gly Phe Met Thr Val Asn Arg Gly Asp Asn Leu His Gln Lys Thr
20 25 30
Pro Glu Val Thr Val Leu Asp Asn Arg Gly Leu Thr Val Arg Glu Leu
35 40 45
Arg Tyr His Arg His Pro Asn Thr Pro Thr Thr Thr Asp Glu Arg Ile
50 55 60
Thr Arg His Arg Phe Thr Leu Ser Gly Gln Leu Ala His Ser Ile Asp
65 70 75 80
Pro Arg Leu Phe Asp Leu Gln Gln Thr Asp Asn Thr Val Asn Pro Asn
85 90 95
Met Ile Tyr Asp Thr Ala Leu Thr Gly Glu Val Val Arg Thr Arg Ser
100 105 110
Val Asp Ala Gly Asn Asp Leu Ile Leu Asn Asp Ile Thr Gly Arg Pro
115 120 125
Val Leu Ala Ile Asn Ala Thr Glu Val Thr Arg Thr Trp Gln Tyr Glu
130 135 140
Asn Asp Thr Leu Pro Gly Arg Pro Leu Ser Ile Thr Glu Gln Pro Ala
145 150 155 160
Gly Glu Ala Gly Arg Ile Thr Glu Arg Phe Val Trp Ala Gly Asn Ser
165 170 175
Gln Ala Glu Lys Asn Ser Asn Leu Ala Gly Gln Cys Val Arg His Tyr
180 185 190
Asp Thr Ala Gly Leu Asn Gln Thr Asp Ser Ile Ala Leu Asn Gly Ile
195 200 205
Pro Leu Ser Val Thr Arg Gln Leu Leu Pro Asp Gly Thr Asp Ala Asp

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210	215	220
Trp Gln Gly Asn Asn Glu Pro Ala Trp Asn Asp Arg Leu Ala Pro Glu		
225	230	235
Asn Phe Thr Thr Leu Ser Thr Ala Asp Ala Thr Gly Ala Val Leu Thr		
	245	250
Thr Thr Asp Ala Ala Gly Asn Leu Gln Arg Val Ala Tyr Asp Val Ala		
	260	265
Gly Leu Leu Thr Gly Ser Trp Leu Arg Leu Ala Gly Gly Thr Glu Gln		
	275	280
Val Ile Val Lys Ser Leu Thr Tyr Ser Ala Ala Gly Gln Lys Leu Arg		
	290	295
Glu Glu His Gly Asn Gly Val Val Thr Thr Tyr Thr Tyr Glu Pro Glu		
305	310	315
Thr Gln Arg Leu Val Gly Ile Lys Thr Lys Arg Pro Gln Gly His Ala		
	325	330
Gln Gly Thr Lys Val Leu Gln Asp Leu Arg Tyr Glu Tyr Asp Pro Val		
	340	345
Gly Asn Val Val Lys Val Thr Asn Asp Ala Glu Val Thr Arg Phe Trp		
	355	360
Arg Asn Gln Lys Val Val Pro Glu Asn Thr Tyr Val Tyr Asp Ser Leu		
	370	375
Tyr Gln Leu Val Ser Ala Thr Gly Arg Glu Met Ala Asn Ile Val Gln		
385	390	395
Gln Ser Thr Leu Leu Pro Thr Pro Ser Leu Ile Asp Ser Ser Thr Tyr		
	405	410
Ser Asn Tyr Ser Arg Thr Tyr Asn Tyr Asp Arg Gly Asp Asn Leu Thr		
	420	425
Gln Ile Arg His Ser Ala Pro Ala Thr Gly Asn Ser Tyr Thr Thr Asp		
	435	440
Ile Thr Val Ser Asp His Ser Asn Arg Ala Val Leu Asp Thr Leu Thr		
	450	455
Asp Asp Pro Ala Lys Val Asp Ala Leu Phe Thr Ala Gly Gly His Gln		
465	470	475
Ile Pro Leu Gln Pro Gly Gln Asn Leu Val Trp Thr Pro Arg Gly Glu		
	485	490
Leu Leu Lys Val Ala Pro Val Val Arg Asp Gly Gln Ile Ser Asp Gln		
	500	505
Glu Ser Tyr Arg Tyr Asp Ala Ala Ser Gln Arg Ile Ile Lys Thr His		
	515	520
Val Gln Gln Thr Ala Asn Ser Ser Gln Ala Gln Ser Thr Leu Tyr Leu		
	530	535
Pro Gly Leu Glu Arg His Thr Thr Ile Asn Gly Thr Thr Val Lys Glu		
545	550	555
Val Leu His Val Ile Thr Ile Gly Glu Ala Gly Arg Ala Gln Val Arg		
	565	570
Val Leu His Trp Glu Asn Gly Lys Pro Gly Ala Ile Ser Asn Asn Gln		
	580	585
Met Arg Tyr Ser Tyr Asp Asn Leu Ile Gly Ser Ser Gly Leu Glu Val		
	595	600
Asp Gly Asp Gly Gln Ile Ile Ser Met Glu Glu Tyr Tyr Pro Tyr Gly		
	610	615
Gly Thr Ala Val Trp Thr Ala Arg Ser Gln Thr Glu Ala Asp Tyr Lys		
625	630	635
Thr Val Arg Tyr Ser Gly Lys Glu Arg Asp Ala Thr Gly Leu Tyr Tyr		
	645	650
Tyr Gly Tyr Arg Tyr Tyr Gln Pro Trp Ala Gly Ser Trp Leu Ser Ala		
	660	665
		670

0909074-1000T

Asp Pro Ala Gly Thr Ile Asp Gly Leu Asn Leu Tyr Arg Met Val Arg
 675 680 685
 Asn Asn Pro Ala Thr Leu Asp Asp Lys Asn Gly Leu Ala Pro Gly Asn
 690 695 700
 Arg Tyr Val Phe Phe Pro Phe Ile His Glu Asp Arg Ile Phe Arg Leu
 705 710 715 720
 Ala Ser Ala Asn Val Tyr Arg Thr Glu His Asn Lys Ser Asp Ile Ile
 725 730 735
 Ala Val Val Glu Asp Lys Ala Leu Asp Ser Lys Leu Phe Thr Asn Ser
 740 745 750
 Ile Glu Gln Phe Phe Lys Lys Pro Lys Gly Lys Ala Ile Leu Lys Gly
 755 760 765
 Ser Pro Asp Ile Lys Glu Arg Leu Leu Asn Asn Ile Val His Asp Leu
 770 775 780
 Ser Asn Met Gln Val Gly Asp Gln Leu Tyr Val Asn Ala His Gly His
 785 790 795 800
 Ser Ala Lys Pro Phe Phe Tyr Ser Asp Ser Gly Tyr Ser Lys Ile Ile
 805 810 815
 Met Glu Gln Leu Gln Arg Gly Ala Asn Tyr Val Ala Lys Asp Leu Val
 820 825 830
 Asn Lys Phe Lys Leu Pro Glu Asn Ala Thr Ile Lys Ile Ser Thr Cys
 835 840 845
 His Ser Ala Glu Gly Lys Gly Ala His Ile Thr Val Thr Ser Thr Gly
 850 855 860
 Thr Asn Glu Lys Met Arg Tyr Ser Ser Ile Ile Glu Asn Lys Gly Glu
 865 870 875 880
 Phe Ser Arg Ser Leu Ala Gly Thr Met Glu Asn Glu Leu Ile Lys Leu
 885 890 895
 Gln Pro Gly Arg Val Arg Gly Asn Val Tyr Gly Tyr Leu Gly Ala Thr
 900 905 910
 Thr Phe Tyr Gly Ala Lys Asn Glu Lys Val Ile His Leu Lys Asp Gly
 915 920 925
 Asn Leu Thr Thr Gly Val His Glu Gly Lys Leu Ser Met Phe Thr Lys
 930 935 940
 Lys Asn Arg Phe Ser Glu Asn Ile Phe Gly Leu Lys Val Lys Arg Ser
 945 950 955 960
 Leu Thr Arg Thr Asn Phe Thr Gly Ser Gly Val
 965 970

<210> 4

<211> 108

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<213> Xenorhabdus bovienii

<400> 4

Pro Ala Ala Glu Tyr Val Arg Asp Phe Thr Ile Thr Cys Ser Val Pro
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 Pro Ala Ser Arg Ser Gln Leu Pro Val Ser Arg Pro Ala Thr Ser Tyr
 20 25 30
 Ala Thr Arg Cys Arg Leu Pro Ala Ala Ser Val Val Val Ser Thr Ala
 35 40 45
 Pro Val Ala Ser Ala Val Leu Arg Val Val Lys Phe Ser Gly Ala Ser
 50 55 60
 Arg Ser Phe Gln Ala Gly Ser Leu Phe Pro Cys Gln Ser Ala Ser Val
 65 70 75 80
 Pro Ser Gly Ser Ser Trp Arg Val Thr Asp Ser Gly Met Pro Leu Ser
 85 90 95

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Ile	Ser	Gly	Arg	Ser	Thr	Val	Cys	Thr	Val	Arg	Ala	Gly	Leu	Met	Asn
			20					25					30		
Tyr	Gln	Cys	Trp	Leu	Gln	His	Ala	Ala	Thr	Gln	Leu	Ser	Glu	Ser	Asp
		35					40					45			
Ser	Pro	Lys	Arg	Asp	Ala	Glu	Ile	Leu	Leu	Gly	Tyr	Val	Thr	Gly	Arg
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Ser	Arg	Thr	Tyr	Leu	Ile	Ala	Phe	Asp	Glu	Thr	Leu	Ile	Ser	Ser	Glu

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 Cys Tyr Val Trp Tyr Pro Cys Ser Ala Arg Leu Ser Gly Asn Ala Lys
 20 25 30
 Ser Leu Leu Ala Pro Asp Gly Glu Trp Met Lys His Thr Leu Lys Ser
 35 40 45
 Lys Ala Ser Gly Asn Thr Phe Thr Gly Arg Leu Ile Pro Thr Gly Arg
 50 55 60
 Pro Thr Val Val Thr Ile Asp Lys Ser Gly Ala Asn Thr Ala Ala Leu
 65 70 75 80
 Thr Leu Leu Asn Ala Glu Gly Glu Pro Gln Gln Gly Ile Glu Ile Arg
 85 90 95
 Gln Asn Lys Tyr Leu Asn Asn Arg Ile Glu Gln Asp His Arg His Val
 100 105 110
 Lys Arg Arg Ile Arg Pro Met Leu Gly Phe Lys Ser Phe Arg Arg Ala
 115 120 125
 Gln Thr
 130

<210> 9

<211> 119

<212> PRT

<213> Xenorhabdus bovienii

<400> 9

Ala Leu Leu Phe Leu Ser Glu Ser Arg Val Met Ser Leu Ile Arg Asn
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 Ala Phe Lys Leu Leu His Tyr Pro Val Asp Ile Met Ala Gln Cys Val
 20 25 30
 Arg Trp Ser Leu Thr Tyr Ala Leu Ser Leu Arg Asn Leu Glu Glu Met
 35 40 45
 Met Ala Lys Arg Gly Ile Phe Val Asp His Ala Thr Ile Pro Arg Trp
 50 55 60
 Val Leu Arg Leu Val Pro Leu Leu Ser Lys Ala Phe Arg Lys Arg Lys
 65 70 75 80
 Lys Pro Val Gly Ser Arg Trp Arg Met Asp Glu Thr Tyr Ile Lys Val
 85 90 95
 Lys Gly Gln Trp Lys Tyr Leu Tyr Arg Ser Val Asp Thr Asp Gly Gln
 100 105 110
 Thr Asp Cys Gly Asp Tyr Arg
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Val His Ser Pro Ser Gly Ala Val Ala Pro Gly Lys Phe Phe Ile Glu
 1 5 10 15
 Asn Phe Ala Asp Thr Phe Pro Ala Pro Leu Pro Leu His Pro Phe Ile
 20 25 30
 Asp Ala Cys Ile Gln Gln Gly Phe Gln Leu Leu Pro Cys Leu Ile Ala
 35 40 45
 Ile Ala His Ser Gly Lys Gln Ala Phe Glu Cys Val Leu Leu Asp Arg

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 T00E01-42868860

50 55 60
 Leu Ala Leu Gln Gly Ser Gln Cys Leu Gln Ala Leu Val Leu Pro Val
 65 70 75 80
 Gly Asp Val Asn Gly Gln Thr Ala His Gly Phe Leu Leu Ile Gly Tyr
 85 90 95
 Thr Gln Thr His Ile Ser Thr Tyr Asn Gly Leu Trp Leu Phe Ile Thr
 100 105 110
 Gln Gly Val Arg Tyr Arg Phe Val Arg Gln Thr Phe Val Cys Arg Ser
 115 120 125
 Leu Ser Phe Ser Glu Asp Asp Cys Thr Asn
 130 135

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 Arg Thr Cys Arg Glu Arg Pro Arg Leu Met Asp Tyr Val Leu Thr Lys
 1 5 10 15
 Ala Ala Glu Ala Asp Leu Arg Ala Ile Ile Arg His Thr Arg Lys Gln
 20 25 30
 Trp Gly Asp Ala Gln Val Arg Arg Tyr Ile Thr Ala Leu Glu Gln Gly
 35 40 45
 Ile Ala Arg Leu Ala Val Gly Gln Gly Ser Phe Lys Asp Met Ser Ala
 50 55 60
 Leu Phe Pro Ala Leu Arg Met Ala His Cys Glu Arg His Tyr Val Phe
 65 70 75 80
 Cys Leu Pro Arg Glu Asn Ala Pro Ala Leu Ile Val Ala Ile Phe His
 85 90 95
 Glu Arg Met Asp Leu Leu Thr Arg Leu Ala Asp Arg Leu Lys
 100 105 110

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 Glu Lys Thr Met Ser Arg Leu Thr Ile Asp Ile Thr Asp Arg Gln His
 20 25 30
 Gln Ser Leu Lys Ala Leu Ala Ala Leu Gln Gly Lys Thr Ile Lys Gln
 35 40 45
 Tyr Ala Leu Glu Arg Leu Phe Pro Gly Met Ser Asp Ser Asp Gln Ala
 50 55 60
 Trp Gln Glu Leu Lys Ala Leu Leu Asp Thr Arg Ile Asn Glu Gly Met
 65 70 75 80
 Glu Gly Lys Gly Cys Gly Lys Ser Ile Gly Glu Ile Leu Asp Glu Glu
 85 90 95
 Leu Ala Gly Ser Asp Arg Ala
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0989974-103001

<213> Xenorhabdus bovienii

<400> 13

Asn Ala His Phe Leu Ile Val Ser Lys Thr Asn Val Val Met Ser Asn
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 Gln Asp Pro His Asn Lys Arg Asp Ser Leu Phe Ser Ala Pro Ile Ala
 20 25 30
 Asn Leu Gly Asp Trp Ser Phe Asp Glu Arg Val Ala Glu Val Phe Pro
 35 40 45
 Asp Met Val Lys Arg Ser Ile Pro Gly Tyr Ser Asn Ile Ile Ser Met
 50 55 60
 Ile Gly Met Leu Ala Ser Arg Phe Val Thr Pro Gly Ser Gln Ile Tyr
 65 70 75 80
 Asp Leu Gly Cys Ser Leu Gly Ala Ala Thr Leu Ser Ile Arg Arg Ser
 85 90 95
 Ile Asn Ala Asp Asn Cys Arg Ile Ile Ala Ile Asp Asn Ser Pro Ala
 100 105 110
 Met Ile Glu Arg Cys Arg Arg His Ile Asp Ser Phe Lys Ala Ser Thr
 115 120 125
 Pro Val Glu Val Ile Glu Gln Asn Ile Leu Asp Thr Asp Ile Gln Asn
 130 135 140
 Ala Ser Met Val Val Leu Asn Phe Thr Leu Gln Phe Leu His Pro Asp
 145 150 155 160
 Asp Arg Gln Lys Ile Leu Lys Lys Ile Tyr Ala Gly Leu Lys Pro Gly
 165 170 175
 Gly Val Leu Val Leu Ser Glu Lys Phe Asn Phe Glu Asp Gln Lys Ile
 180 185 190
 Gly Glu Leu Leu Phe Asn Met His His Asp Phe Lys Arg Ala Asn Gly
 195 200 205
 Tyr Ser Glu Leu Glu Val Ser Gln Lys Arg Ser Met Leu Glu Asn Val
 210 215 220
 Met Arg Thr Asp Ser Val Asp Thr His Lys Ser Arg Leu Lys Glu Val
 225 230 235 240
 Gly Phe Gln His Val Glu Val Trp Phe Gln Cys Phe Asn Phe Gly Ser
 245 250 255
 Leu Leu Ala Ile Lys Gly Thr Glu Gln
 260 265

<210> 14

<211> 324

<212> PRT

<213> Xenorhabdus bovienii

<400> 14

Thr Met Ile Asp Phe Gly Asn Phe Tyr Gln Leu Ile Ala Lys His Pro
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 Leu Asn His Trp Leu Asp Ser Leu Pro Ala Gln Leu Ser His Trp Gln
 20 25 30
 Lys Thr Ser Gln His Gly Gln Phe Ser Ser Trp Val Lys Ile Leu Glu
 35 40 45
 Asn Leu Pro Glu Ile Lys Pro Ser His Leu Asp Leu Lys Asn Gly Val
 50 55 60
 Ile Ala Ile His Glu Pro Asp Leu Ser Lys Gly Glu Lys Ala Arg Leu
 65 70 75 80
 His Asn Ile Leu Lys Ile Leu Met Pro Trp Arg Lys Gly Pro Phe Ser
 85 90 95
 Leu Tyr Asp Val Glu Ile Asp Thr Glu Trp Arg Ser Asp Trp Lys Trp

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100 105 110
 Glu Arg Val Leu Pro His Ile Ser Pro Leu Glu Gly Lys Thr Val Leu
 115 120 125
 Asp Val Gly Cys Gly Ser Gly Tyr His Met Trp Arg Met Val Gly Glu
 130 135 140
 Gly Ala Gln Leu Val Val Gly Ile Asp Pro Thr Gln Leu Phe Leu Cys
 145 150 155 160
 Gln Phe Glu Ala Ile Arg Lys Leu Leu Gly Asn Asn Gln Arg Ala His
 165 170 175
 Leu Leu Pro Leu Gly Ile Glu Gln Leu Pro Glu Leu Gln Ala Phe Asp
 180 185 190
 Thr Val Phe Ser Met Gly Val Leu Tyr His Arg Arg Ser Pro Leu Asp
 195 200 205
 His Leu Trp Gln Leu Lys Asn Gln Leu Val Ser Asp Gly Glu Leu Val
 210 215 220
 Leu Glu Ser Leu Val Ile Glu Gly Asp Glu Asn Gln Cys Leu Ile Pro
 225 230 235 240
 Gly Glu Arg Tyr Ala Gln Met Arg Asn Val Tyr Phe Ile Pro Ser Ala
 245 250 255
 Lys Met Leu Lys Val Trp Leu Glu Lys Cys Gly Phe Val Asp Val Arg
 260 265 270
 Ile Val Asp His Ala Ala Thr Thr Pro Asp Glu Gln Arg Arg Thr Glu
 275 280 285
 Trp Met Lys Thr Glu Ser Leu Val Asp Phe Leu Asp Pro Ser Asp His
 290 295 300
 Ser Lys Thr Ile Glu Gly Tyr Pro Ala Pro Leu Arg Ala Val Leu Ile
 305 310 315 320
 Ala Arg Lys Pro

<210> 15
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<400> 15
 Ser Leu Gln Ile Asp Arg Glu Lys Val Gly Leu Asp Arg Tyr Pro Gln
 1 5 10 15
 Pro Ile Glu Arg Leu Arg Gln Pro Cys Ala Thr Cys Asp Asn His Cys
 20 25 30
 His Ser Arg His Gln Val Arg Phe Phe Leu Leu Lys Glu Lys Tyr Gly
 35 40 45
 Ala Ala Leu Ala Pro Ile Ser Ser Gln Ser Ala Ile Arg Tyr Gln Phe
 50 55 60
 Gln Arg His Thr Met Lys Lys Gly Leu Phe Ala Met Ala Ser Ile Phe
 65 70 75 80
 Ser Gly Tyr Cys Gly Gly Glu Leu Phe His Leu Leu Thr Asp Pro Ala
 85 90 95
 His Glu Ser Gln
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<210> 16
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<400> 16

T0000T-4288880

Ser Ser Phe Arg Leu Asn Asp Asp Leu Leu Thr Asn Ser Tyr Ser Glu
 1 5 10 15
 Gly Phe Leu Met Ile Lys Leu Glu Ile Cys Cys Tyr Ser Ile Ser Cys
 20 25 30
 Ala Leu Val Ala Gln Asn Ala Gly Ala Asp Arg Ile Glu Leu Ser Ala
 35 40 45
 Ser Pro Leu Glu Gly Gly Leu Thr Pro Ser Phe Gly Ala Leu Gln Gln
 50 55 60
 Ser Leu Gln Arg Leu Ser Ile Pro Val His Pro Ile Val Arg Pro Arg
 65 70 75 80
 Gly Gly Asp Phe Cys Tyr Asn Asn Met Asp Phe Glu Ala Met Lys Asn
 85 90 95
 Asp Val Ala Arg Ile Arg Asp Met Gly Phe Pro Gly Ile Val Phe Gly
 100 105 110
 Ile Leu Ser Glu Asn Gly His Ile Asp Arg Leu Arg Met Arg Gln Leu
 115 120 125
 Met Ser Leu Ser Gly Asn Met Ala Val Thr Phe His Arg Ala Phe Asp
 130 135 140
 Met Cys Phe Asn Pro His Val Ala Leu Glu Gln Leu Thr Glu Leu Gly
 145 150 155 160
 Val Gln Arg Ile Leu Thr Ser Gly Gln Gln Gln Asn Ala Glu Leu Gly
 165 170 175
 Leu Thr Leu Leu Lys Glu Leu Met Gln Ala Ser Arg Gly Pro Ile Ile
 180 185 190
 Met Pro Gly Ala Gly Val Arg Val Ser Asn Ile Ser Lys Phe Leu Glu
 195 200 205
 Ala Gly Met Thr Glu Val His Ser Ser Ala Gly Lys Ile Val Pro Ser
 210 215 220
 Thr Met Lys Tyr Arg Lys Val Gly Val Ala Met Ser Ser Asp Asp Arg
 225 230 235 240
 Asp Val Asp Glu Tyr Ser His Tyr Ser Val Asp Gly Glu Leu Val Glu
 245 250 255
 Ser Met Lys Gly Val Met Ser Leu Ile Lys Arg
 260 265

<210> 17

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<400> 17

Tyr Phe Gly Lys Asn Arg Arg Phe Val Ile Tyr Val Thr Leu Met Glu
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 Arg Asn Phe Tyr Gly Leu Phe Asn Gly Glu Glu Met Ser His Phe Ser
 20 25 30
 Lys Ile Ser Glu Leu Gln Asp Leu Val Ala Asp Leu Ala Gly Phe Glu
 35 40 45
 Gln Lys Leu Lys Gln Phe Glu Gly His Leu Gly Leu His Phe Glu Gln
 50 55 60
 Tyr Ser Ala Asp His Ile Ser Leu Arg Cys Asn Glu Ser Lys Ile Ala
 65 70 75 80
 Asp Arg Trp Arg Lys Gly Phe Leu Gln Cys Gly Gln Leu Ile Ser Glu
 85 90 95
 Ser Ile Ile Asn Gly Arg Pro Ile Cys Leu Phe Asp Leu Asn Gln Pro
 100 105 110
 Ile Val Leu Leu Asp Trp Lys Ile Asp Cys Val Glu Leu Pro Tyr Pro
 115 120 125

T.D.D.E.T. 4/852260

Ser Gln Lys His Tyr Val His Gln Gly Trp Glu His Val Glu Leu Val
 130 135 140
 Leu Pro Val Pro Pro Glu Gln Leu Ile Cys Glu Ala Lys Lys Leu Leu
 145 150 155 160
 Pro Gln Pro Leu Pro Asp Asn Phe Arg Met Lys Glu Ser His Pro Lys
 165 170 175
 Gly Lys Asn Glu Arg Leu Pro Asn Pro Ile Leu Ala Val
 180 185

<210> 18
 <211> 579
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 18
 Gly Asn Thr Val Asn Ile Gln Val Ile Leu Ser Glu Lys Ile Ser Asn
 1 5 10 15
 Ala Leu Ile Glu Ala Gly Ala Pro Thr Asp Ser Glu Ala His Val Arg
 20 25 30
 Gln Ser Ala Lys Ala Gln Phe Gly Asp Tyr Gln Ala Asn Gly Val Met
 35 40 45
 Ala Ala Ala Lys Lys Val Gly Ile Pro Pro Arg Gln Leu Ala Glu Lys
 50 55 60
 Val Val Ser Gln Leu Asp Leu Gln Gly Ile Ala Ser Lys Val Glu Ile
 65 70 75 80
 Ala Gly Pro Gly Phe Ile Asn Ile Phe Leu Asp Lys Ala Trp Val Ala
 85 90 95
 Ala Asn Ile Glu Thr Thr Leu Lys Asp Glu Lys Leu Gly Ile Thr Pro
 100 105 110
 Val Glu Pro Gln Thr Ile Val Ile Asp Tyr Ser Ala Pro Asn Val Ala
 115 120 125
 Lys Gln Met His Val Gly His Leu Arg Ser Thr Ile Ile Gly Asp Ala
 130 135 140
 Ala Ala Arg Thr Leu Glu Phe Leu Gly His Lys Val Ile Arg Ala Asn
 145 150 155 160
 His Val Gly Asp Trp Gly Thr Gln Phe Gly Met Leu Ile Ala Tyr Leu
 165 170 175
 Glu Lys Ile Gln Asn Glu Asn Ala Asn Asp Met Ala Leu Ala Asp Leu
 180 185 190
 Glu Ala Phe Tyr Arg Glu Ala Lys Lys His Tyr Asp Glu Asp Glu Glu
 195 200 205
 Phe Ala Ile Arg Ala Arg Asn Tyr Val Val Lys Leu Gln Gly Gly Asp
 210 215 220
 Glu Tyr Cys Arg Lys Met Trp Arg Lys Leu Val Asp Ile Thr Met Ser
 225 230 235 240
 Gln Asn Gln Glu Thr Tyr Asn Arg Leu Asn Val Thr Leu Thr Glu Lys
 245 250 255
 Asp Val Met Gly Glu Ser Leu Tyr Asn Asp Met Leu Pro Gly Ile Val
 260 265 270
 Ala Asp Leu Lys Gln Arg Gly Ile Ala Val Lys Ser Asp Gly Ala Thr
 275 280 285
 Val Val Tyr Leu Asp Glu Phe Lys Asn Lys Glu Gly Glu Pro Met Gly
 290 295 300
 Val Ile Ile Gln Lys Lys Asp Gly Gly Tyr Leu Tyr Thr Thr Thr Asp
 305 310 315 320
 Ile Ala Cys Ala Lys Tyr Arg His Glu Thr Leu Asn Ala Ser Arg Val
 325 330 335

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Leu Tyr Tyr Ile Asp Ser Arg Gln His Gln His Leu Met Gln Ala Trp
 340 345 350
 Ala Ile Val Arg Lys Thr Gly Tyr Ile Pro Glu Ser Met Ser Leu Glu
 355 360 365
 His His Met Phe Gly Met Met Leu Gly Lys Asp Gly Lys Pro Phe Lys
 370 375 380
 Thr Arg Ala Gly Gly Thr Val Arg Leu Ser Asp Leu Leu Asp Glu Ala
 385 390 395 400
 Ile Glu Arg Ala Asp Thr Leu Ile Arg Glu Lys Asn Pro Asp Met Pro
 405 410 415
 Glu Asp Glu Leu Lys Lys Val Val Glu Ala Val Gly Ile Gly Ala Val
 420 425 430
 Lys Tyr Ala Asp Leu Ser Lys Ser Arg Thr Thr Asp Tyr Val Phe Asp
 435 440 445
 Trp Asp Asn Met Leu Ala Phe Glu Gly Asn Thr Ala Pro Tyr Met Gln
 450 455 460
 Tyr Ala Tyr Thr Arg Val Ser Ser Ile Phe Lys Arg Ala Asp Ile Asp
 465 470 475 480
 Glu Asn Ser Leu Thr Leu Pro Val Met Leu Asn Glu Glu Arg Glu Gln
 485 490 495
 Ala Leu Ala Thr Arg Leu Leu Gln Phe Glu Glu Thr Ile Thr Thr Val
 500 505 510
 Ala Arg Glu Gly Thr Pro His Val Met Cys Ala Tyr Leu Tyr Asp Leu
 515 520 525
 Ala Gly Leu Phe Ser Gly Phe Tyr Glu His Cys Pro Ile Leu Asn Ala
 530 535 540
 Asp Ser Glu Glu Leu Arg Gln Ser Arg Leu Lys Leu Ala Leu Leu Thr
 545 550 555 560
 Ala Lys Thr Leu Lys Gln Gly Leu Asp Thr Leu Gly Ile Gln Thr Val
 565 570 575
 Glu Arg Met

<210> 19
 <211> 126
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 19
 Ala Gln Val Ser Asn Met His Leu Leu Gly Asp Ile Arg Cys Gly Ile
 1 5 10 15
 Ile Asp Asn Asp Gly Leu Arg Phe His Trp Gly Asp Thr Glu Leu Phe
 20 25 30
 Ile Phe Gln Gly Ser Phe Tyr Ile Cys Cys Asn Pro Arg Phe Ile Lys
 35 40 45
 Lys Asn Ile Asp Lys Thr Trp Ala Cys Asn Phe Asn Phe Ala Gly Asn
 50 55 60
 Ser Leu Gln Ile Gln Leu Ala Asp Asp Phe Phe Cys Gln Leu Ser Arg
 65 70 75 80
 Arg Tyr Ser His Leu Phe Ser Gly Ser His His Thr Ile Arg Leu Ile
 85 90 95
 Val Thr Lys Leu Cys Phe Gly Arg Leu Thr Asp Val Ser Phe Thr Val
 100 105 110
 Gly Trp Ser Ala Ser Phe Asn Gln Arg Ile Ala Asp Phe Phe
 115 120 125

<210> 20

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<211> 104
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 20
 His Ala Arg Val Gly Val Leu His Ile Arg Cys Arg Val Ala Phe Lys
 1 5 10 15
 Gly Gln His Ile Ile Pro Val Glu Asn Ile Val Cys Ser Thr Ala Leu
 20 25 30
 Gly Lys Ile Cys Ile Phe His Arg Ala Asn Pro Tyr Arg Phe His Asp
 35 40 45
 Phe Phe Gln Phe Val Phe Trp His Ile Trp Val Phe Leu Thr Asn Glu
 50 55 60
 Gly Ile Arg Thr Leu Asn Arg Phe Ile Gln Gln Ile Gly Gln Ser Tyr
 65 70 75 80
 Cys Ala Ala Gly Thr Gly Phe Glu Trp Phe Thr Ile Phe Ala Gln His
 85 90 95
 His Ala Lys His Val Val Phe Glu
 100

<210> 21
 <211> 120
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 21
 Tyr His Ala Ser Phe Gln Leu Cys Arg Arg Leu Leu His Thr Phe Tyr
 1 5 10 15
 Ser Leu Asn Thr Gln Ser Ile Lys Thr Leu Leu Gln Ser Phe Arg Cys
 20 25 30
 Gln Gln Ser Gln Leu Gln Ala Ala Leu Ala Gln Phe Phe Ala Ile Gly
 35 40 45
 Ile Gln Asp Arg Ala Val Leu Ile Glu Thr Arg Glu Gln Thr Gly Gln
 50 55 60
 Ile Val Gln Val Cys Thr His Asn Met Trp Arg Thr Phe Thr Gly Asp
 65 70 75 80
 Gly Ser Asp Arg Phe Phe Lys Leu Gln Gln Ala Gly Cys Gln Cys Leu
 85 90 95
 Leu Ala Phe Phe Ile Gln His His Arg Gln Cys Gln Ala Val Phe Ile
 100 105 110
 Asp Ile Arg Thr Phe Lys Asp Arg
 115 120

<210> 22
 <211> 334
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 22
 Phe Thr Leu Arg Glu Asp Ser Met Ser Asp Trp Thr Gly Val Ser Thr
 1 5 10 15
 Phe Asn Val Ile Leu Glu Thr Gly Leu Asp Asn Cys Asn Ile Tyr Ala
 20 25 30
 Asn Gly Leu Asn Met Ile Gly Val Ile Ile Asn Ile Thr Pro Thr Asp
 35 40 45
 Asp Glu Gly Asn Phe Val Asp Ile Asp Asp Val Thr Leu Asn Asp Asn
 50 55 60

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Ile Lys Ile Val Asp Tyr Ile Asp Gly Ser Asp Ile Asp Gly Ser Asp
 65 70 75 80
 Gly Trp Phe Tyr Thr Gly Asn Pro Asn Glu Tyr Asn Thr Ile Pro Asn
 85 90 95
 Ser Gln Ser Tyr Ser Leu Leu Lys Ser Glu Asn Ser Gln Ile Thr Gln
 100 105 110
 Ile Lys Arg Tyr Val Ser Cys Ser Asn Thr Ser Arg Leu Arg Thr Lys
 115 120 125
 Ser Phe Ser Ala Lys Val Thr Thr Ser Gly Lys Val Ile Ser Ile
 130 135 140
 Thr Gln Asn Ser Ile Asn Ser Ser Arg Val Val Ile Asn Ala Ile Asp
 145 150 155 160
 Ala Thr Asn Phe Thr Asp Asp Glu Leu Arg Thr Thr Lys Glu Thr Arg
 165 170 175
 Phe Glu Asn Gln Ser Tyr Thr Ser His Lys Ser Ser Thr Asn Ser Leu
 180 185 190
 Tyr Val His Thr Trp Thr Ile Pro Arg Ser Leu Lys Leu Gln Asn Trp
 195 200 205
 Arg Trp Glu Asp Tyr Asn Asn Gly Trp Thr Trp Ala Gln Ser Cys Tyr
 210 215 220
 Tyr Lys Thr Gly Ala Asp Gly Gly Ser Glu Ser Thr Arg Trp Leu Ala
 225 230 235 240
 Ala Gly Ser Ile Phe Pro Pro Gly Asn Tyr Asp Gly Leu Trp Leu Asp
 245 250 255
 Asn Asp Ile Ala Leu Ser Gly Met Ala His Lys Ser Tyr Asn Val Asp
 260 265 270
 Thr Gly Ile Asn Gln Leu Ser Phe Thr Arg Ile Ile Gly Lys Gly Phe
 275 280 285
 Ser Trp Val Tyr Asn Ile Ser Gly Leu Asp Arg Gly His Ala Val Ile
 290 295 300
 Ile Ile Asp Gln Tyr Gly Asn Lys Tyr Arg Ile Leu Phe His Ala Gly
 305 310 315 320
 Tyr Glu Asn Ser Asp Pro Tyr Leu Ser Ser Ser Ile Val Tyr
 325 330

<210> 23

<211> 1673

<212> PRT

<213> Xenorhabdus bovienii

<400> 23

Val Tyr Ile Lys Phe Leu Lys Leu Phe Arg Arg Ile Thr Met Ser Asp
 1 5 10 15
 Asn Asn Glu Phe Phe Thr Gln Ala Asn Asn Phe Thr Ser Ala Val Ser
 20 25 30
 Gly Gly Val Asp Pro Arg Thr Gly Leu Tyr Asn Ile Gln Ile Thr Leu
 35 40 45
 Gly His Ile Val Gly Asn Gly Asn Leu Gly Pro Thr Leu Pro Leu Thr
 50 55 60
 Leu Ser Tyr Ser Pro Leu Asn Lys Thr Asp Ile Gly Phe Gly Ile Gly
 65 70 75 80
 Phe Asn Phe Gly Leu Ser Val Tyr Asp Arg Lys Asn Ser Leu Leu Ser
 85 90 95
 Leu Ser Thr Gly Glu Asn Tyr Lys Val Ile Glu Thr Asp Lys Thr Val
 100 105 110
 Lys Leu Gln Gln Lys Lys Leu Asp Asn Leu Arg Phe Glu Lys Asp Leu
 115 120 125

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Lys Glu Asn Cys Tyr Arg Ile Ile His Lys Ser Gly Asp Ile Glu Val
 130 135 140
 Leu Thr Gly Phe Asn Asn Asn Ala Phe Asp Leu Lys Val Pro Lys Lys
 145 150 155 160
 Leu Leu Asn Pro Ala Gly His Ala Ile Tyr Ile Asp Trp Asn Phe Glu
 165 170 175
 Ala Thr Gln Pro Arg Leu Asn Arg Ile Tyr Asp Asp Leu Asp Gly His
 180 185 190
 Asp Ile Pro Leu Leu Asn Leu Glu Tyr Gln Gly Leu Ile Lys Thr Ile
 195 200 205
 Leu Thr Leu Phe Pro Gly Gln Lys Glu Gly Tyr Arg Thr Glu Leu Arg
 210 215 220
 Phe Leu Asn Arg Gln Leu Asn Ser Ile His Asn Phe Ser Leu Gly Asn
 225 230 235 240
 Glu Asn Pro Leu Thr Trp Ser Phe Gly Tyr Thr Pro Ile Gly Lys Asn
 245 250 255
 Gly Ile Leu Gly Gln Trp Ile Thr Ser Met Thr Ala Pro Gly Gly Leu
 260 265 270
 Lys Glu Thr Val Asn Tyr Ser Asn Asn Asn Gln Gly His His Phe Pro
 275 280 285
 Gln Ser Ala Asn Leu Pro Val Leu Pro Tyr Val Thr Leu Met Lys Gln
 290 295 300
 Val Pro Gly Ala Gly Gln Pro Ala Ile Gln Ala Glu Tyr Ser Tyr Thr
 305 310 315 320
 Ser His Asn Tyr Val Gly Gly Gly Ser Asn Gly Ile Trp Asn Asn Lys
 325 330 335
 Leu Asp Asn Leu Tyr Gly Leu Met Thr Glu Tyr Asn Tyr Gly Ser Thr
 340 345 350
 Glu Ser Arg Arg Tyr Lys Asp Lys Glu Gly His Asp Gln Ile Val Arg
 355 360 365
 Ile Glu Arg Thr Tyr Asn Asn Tyr His Leu Leu Thr Ser Glu Cys Lys
 370 375 380
 Gln Gln Asn Gly Tyr Ile Gln Thr Thr Glu Thr Ala Tyr Tyr Ala Ile
 385 390 395 400
 Ile Gly His Asn Phe Asp Ser Gln Pro Ser Gln Phe Gln Leu Pro Lys
 405 410 415
 Thr Lys Thr Glu Thr Thr Phe Asp Glu Ser Gly Asn Pro Leu Thr Lys Val
 420 425 430
 Ile Thr Glu Thr Thr Phe Asp Glu Ser Gly Asn Pro Leu Thr Lys Val
 435 440 445
 Ile Lys Asp Lys Lys Thr Gln Lys Ile Ile Ser Pro Ser Thr His Trp
 450 455 460
 Glu Tyr Tyr Pro Pro Ala Gly Glu Val Asp Asn Cys Pro Pro Glu Pro
 465 470 475 480
 Tyr Gly Phe Thr Arg Phe Val Lys Lys Ile Ile Gln Thr Pro Tyr Asp
 485 490 495
 Ser Glu Phe Lys Asp Asp Pro Glu Lys Phe Ile Gln Tyr Arg Tyr Ser
 500 505 510
 Leu Ile Gly Ser Gln Ser His Val Thr Leu Lys Ile Glu Glu Arg His
 515 520 525
 Tyr Ser Ala Thr Gln Leu Leu Asn Ser Thr Leu Phe Gln Tyr Asn Thr
 530 535 540
 Asp Lys Ser Glu Leu Gly Arg Leu Leu Lys Gln Thr Glu Cys Thr Lys
 545 550 555 560
 Gly Glu Asn Gly Lys Thr Tyr Ser Val Val His Lys Phe Thr Tyr Thr
 565 570 575
 Lys Gln Asp Asp Thr Leu Gln Gln Ser His Ser Ile Thr Thr His Asp

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			580					585					590				
Asn	Phe	Thr	Ile	His	Arg	Ser	Gln	Val	Arg	Ser	Arg	Tyr	Thr	Gly	Arg		
			595						600						605		
Leu	Phe	Ser	Asp	Thr	Asp	Thr	Lys	Asp	Ile	Val	Thr	Gln	Met	Ser	Tyr		
			610						615						620		
Asp	Lys	Leu	Gly	Arg	Leu	Leu	Thr	Arg	Thr	Leu	Asn	Ser	Gly	Thr	Pro		
625						630						635					640
Tyr	Ala	Asn	Thr	Leu	Thr	Tyr	Asp	Tyr	Glu	Leu	Asn	Asn	Leu	Gln	Asp		
			645						650						655		
Asp	Asn	Arg	Pro	Pro	Phe	Val	Ile	Thr	Thr	Thr	Asp	Val	Asn	Gly	Asn		
			660						665						670		
Gln	Leu	Arg	Asn	Glu	Phe	Asp	Gly	Ala	Gly	Arg	His	Val	Ser	Gln	Cys		
			675						680						685		
Leu	Lys	Asp	Ser	Asp	Gly	Asp	Gly	Lys	Phe	Tyr	Thr	Ile	His	Thr	Gln		
			690						695						700		
Gln	Tyr	Asp	Glu	Gln	Gly	Arg	His	His	Thr	Ser	Thr	Tyr	Ser	Asp	Tyr		
705						710						715					720
Leu	Thr	Asn	Gly	Arg	Gln	Gln	Thr	Asp	Pro	Asp	Lys	Val	His	Leu	Ser		
			725						730						735		
Met	Ser	Lys	Ser	Tyr	Asp	Asn	Trp	Gly	Gln	Ile	Ala	Asn	Thr	His	Trp		
			740						745						750		
Ser	Tyr	Gly	Val	Ser	Glu	Lys	Ile	Thr	Val	Asp	Pro	Ile	Thr	Leu	Thr		
			755						760						765		
Ala	Thr	Lys	Gln	Leu	Gln	Ser	Asn	Ser	Asn	Asn	Val	Gln	Thr	Gly	Lys		
			770						775						780		
Glu	Val	Thr	Thr	Tyr	Thr	Pro	Ser	Gln	Gln	Pro	Ile	Gln	Ile	Thr	Leu		
785						790						795					800
Phe	Asp	Glu	Ala	Gly	His	Leu	Gln	Ser	Cys	His	Thr	Leu	Thr	Arg	Asp		
			805						810						815		
Gly	Trp	Asp	Arg	Val	Arg	Lys	Glu	Thr	Asp	Ala	Ile	Gly	Gln	Cys	Thr		
			820						825						830		
Ile	Tyr	Gln	Tyr	Asp	Asn	Tyr	Asn	Arg	Val	Ile	Gln	Ile	Thr	Leu	Pro		
			835						840						845		
Asp	Gly	Thr	Ile	Val	Asn	Arg	Lys	Tyr	Ala	Pro	Phe	Ser	Thr	Asp	Thr		
			850						855						860		
Leu	Ile	Thr	Asp	Ile	Arg	Val	Asn	Gly	Ile	Ser	Leu	Gly	Gln	Gln	Thr		
865						870						875					880
Phe	Asp	Gly	Leu	Ser	Arg	Leu	Thr	Gln	Ser	Gln	Asp	Gly	Gly	Arg	Val		
			885						890						895		
Trp	Ala	Tyr	Thr	Tyr	Ser	Ala	Gly	Asn	Asp	Gln	Cys	Pro	Ser	Thr	Val		
			900						905						910		
Ile	Thr	Pro	Asp	Gly	Gln	Phe	Ile	His	Tyr	Gln	Tyr	Gln	Pro	Glu	Leu		
			915						920						925		
Asp	Asp	Ala	Val	Leu	Gln	Val	Ala	Ser	Asn	Glu	Ile	Thr	Gln	Gln	Phe		
			930						935						940		
Ser	Tyr	Asn	Pro	Val	Thr	Gly	Ala	Leu	Leu	Lys	Ala	Val	Ala	Glu	Gly		
945						950						955					960
Gln	Ser	Leu	Thr	Pro	Ile	Tyr	Tyr	Pro	Ser	Gly	Arg	Leu	Lys	Met	Glu		
			965						970						975		
Asn	Ile	Asn	Asp	Met	Lys	Lys	Met	Ser	Tyr	Leu	Trp	Thr	Leu	Arg	Gly		
			980						985						990		
Leu	Glu	Asn	Gly	Tyr	Thr												

1490 1495 1500
 Arg Ile Lys Trp Gly Val Thr Arg Ser Leu Asp Arg Glu Ile Val Arg
 1505 1510 1515 1520
 Asn Glu Glu Gly Gln Val Ile Lys Asp His Ser Arg Gly Tyr Thr Asp
 1525 1530 1535
 Asn Phe Met Gly Lys Gly Glu Gln Ala Ile Leu Val His Gly Asp Lys
 1540 1545 1550
 Asp Gly Phe Leu Tyr His Thr Glu Gly Asn Lys His Asn Gly Lys Gly
 1555 1560 1565
 Pro Tyr Thr Arg His Thr Pro Glu Gln Leu Val Asp Tyr Leu Lys Asp
 1570 1575 1580
 Asn Asn Ile Val Asp Leu Thr Gln Gly Gly Asp Lys Pro Val His Leu
 1585 1590 1595 1600
 Leu Ser Cys Tyr Gly Lys Ser Ser Gly Ala Ala Asp Lys Met Ala Lys
 1605 1610 1615
 Tyr Ile Asn Arg Pro Val Ile Ala Tyr Ser Asn Lys Pro Thr Ile Ser
 1620 1625 1630
 Gln Gly Leu Ala Arg Ile Glu Arg Lys Asp Phe Phe Leu Lys Ser Thr
 1635 1640 1645
 Tyr His Ser Tyr Asp Pro Arg Lys Ile Ile Leu Gly Arg Thr Glu Lys
 1650 1655 1660
 Thr Val Lys Pro Lys Thr Phe Arg Pro
 1665 1670

<210> 24
 <211> 105
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 24
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 1 5 10 15
 Tyr Ile Gly Ser Thr Tyr Tyr Gly Asn Arg Lys Ser Thr Val Leu Tyr
 20 25 30
 Ala Ala Ile Leu His Ser Val Ser Leu Phe Tyr Leu Leu Ile Ala Val
 35 40 45
 Phe Ser Ala Ser Ser Ala Gly Tyr Leu Thr Tyr Gly Leu Ser Tyr His
 50 55 60
 Thr Ile Ser Val Gln Phe Leu Gly Leu Ser His Gln Ile Pro Leu Leu
 65 70 75 80
 Leu Ser Thr Tyr Asp Gln Ser Leu Asn Leu Leu Leu Asp Tyr Gln Tyr
 85 90 95
 Gly Asp Ser Gly His Arg Asn Leu Glu
 100 105

<210> 25
 <211> 129
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 25
 Ser Ala Gln Cys Ile Val Gly Lys Val Phe Arg Ile Ser Met Val Ile
 1 5 10 15
 Ser Asp Ile Tyr Tyr Ser Thr Ser Leu Ile Ile Phe Gln Pro Asp Ile
 20 25 30
 Ile Arg His Ile Trp Met Ser Val Val Tyr Leu Cys Gln Leu Ala Trp
 35 40 45

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Val Ser Trp Val Gly Lys Phe Glu Gly Ser Met Val Phe Cys Pro Ile
 50 55 60
 Cys Glu Cys Gly Val Thr Gly Gly Asp Ile Ala Ile Asp Ile Ile Ser
 65 70 75 80
 Lys Ile Leu Cys Asp Tyr Ala Met Ala Ile Phe Val Cys Arg Ala Phe
 85 90 95
 Arg Thr Val Thr Phe Ile Leu Val Gln Pro Ile Thr Gly Ile Val Arg
 100 105 110
 Val Leu Phe Cys Thr Leu Gln Tyr Ser Ile Gln Phe His Tyr Ser Ile
 115 120 125
 Cys

<210> 26
 <211> 141
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 26
 Pro Ser Ser Leu Arg Thr Ile Ser Leu Ser Lys Leu Leu Val Thr Pro
 1 5 10 15
 His Phe Ile Leu Glu Leu Ser Glu Val Asp Leu Ser Lys Ala Phe Ser
 20 25 30
 Pro Ser Ser Ala Asn Ala Pro Arg Cys Val Ala Ser Leu Val Pro Pro
 35 40 45
 Leu Met Ala Asp Ser Ala Asn Pro Ala Ala Pro Ile Pro Ile Glu Thr
 50 55 60
 His Pro Ser Ile Glu Asp Ala Phe Gly Glu Ala Ser Ser Ser Ala Pro
 65 70 75 80
 Leu Thr Ile Asp Val Ile Ser Asp Val Thr Leu Ser Ala Pro Asn Ala
 85 90 95
 Ser Ala Val Val Glu Val Glu Ala Ile Ala Ala Ala Ile Pro Pro Ala
 100 105 110
 Ala Ala Ile Ala Ile Pro Pro Val Ala Met Val Ser Ser Asn Pro Ala
 115 120 125
 Ile Pro Met Pro Ile Pro Val His Ala Cys Gln Leu Lys
 130 135 140

<210> 27
 <211> 101
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 27
 Ala His Cys His Ile Ala Leu Phe Pro Cys Trp His Asn Pro Gln Tyr
 1 5 10 15
 Cys Gln Gln His Pro Asp His His Ser Asn Cys His His Gln Phe Lys
 20 25 30
 Gln Glu Tyr Pro Pro Ser Arg Gln Arg Arg Glu Asn Ile Thr Leu Thr
 35 40 45
 Gln Leu Pro Ile Lys His Thr Gly Ile Glu Ala Gly Ser Gln Thr Asn
 50 55 60
 Arg Lys Arg Gln Thr Cys Met Phe Gln Arg Ala Asn Glu Ser Lys Val
 65 70 75 80
 His Gln Leu Gly Gln Asn Gln Gly Arg Asp Arg Asn Phe Tyr Trp Cys
 85 90 95
 Phe Asp Ile Leu Thr

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100

<210> 28
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 <212> PRT
 <213> Xenorhabdus bovienii

<400> 28
 Pro Gln Ser Thr Pro Ser Ser Gln Asn Ser Arg Gln Leu Thr Pro Ala
 1 5 10 15
 Glu Ser Ser Gln His Gln Lys Gln Lys Ser Asp His Ile Glu Ile Met
 20 25 30
 Ile Pro Ser Glu Ala Pro Arg Glu Tyr Arg Glu Gln Leu His Lys Ala
 35 40 45
 Thr Pro Ala Arg Asn Arg Asp Val Ala Pro Asn Pro Ser Val Phe Asp
 50 55 60
 Ile Leu Arg Asp Tyr His Trp Lys Asn Phe Ser Pro Val Lys Ala Ala
 65 70 75 80
 Lys Ser Ser Leu Thr Pro His Pro Val His Gln Lys Ala Ile Pro Leu
 85 90 95
 Asn Asp Gln Arg Asn Thr Ser Met Lys Gln Ser Leu Lys Pro Glu Met
 100 105 110
 Arg Gln Lys Leu Tyr
 115

<210> 29
 <211> 124
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 29
 Gly Lys Asn Cys Ile Asn Asp Gln Gly Asn Leu Pro Asp Arg Tyr Thr
 1 5 10 15
 Gln Asn Cys Arg Pro His Leu Thr Asp Asn Pro Pro Tyr Gly Thr Val
 20 25 30
 Thr Glu Arg Asn Pro Arg Gln Tyr Gln His Ala Asp Leu Phe Gln Met
 35 40 45
 Arg Lys Leu Ile Gly Gln Leu Gln Asn Pro Ser Gly Asn Asn Gly Pro
 50 55 60
 Thr Gln Arg Gln His Trp Arg Ile Ala Ile Arg Ser His Lys Gln Cys
 65 70 75 80
 Lys Asn Asp His Thr Asp Ile Glu Gln Cys Arg Ser Lys Ser Arg His
 85 90 95
 Arg Lys Ala Val Pro Cys Ile Lys Asn Cys Ala Ser Gln Arg Ser Gln
 100 105 110
 Arg Asn Gln Lys Asp Ile Arg Lys Arg Asn Ser Lys
 115 120

<210> 30
 <211> 515
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 30
 Asn Asn Thr Met Asn Leu Leu Lys Ser Leu Ala Ala Val Ser Ser Met
 1 5 10 15
 Thr Met Phe Ser Arg Val Leu Gly Phe Ile Arg Asp Ala Ile Ile Ala

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Leu Leu Arg Leu Met Gly Val Val Ile Ala Gly Ala Gly Ser Tyr Phe
 485 490 495
 Ala Val Leu Ala Leu Met Gly Phe Arg Leu Lys Asp Phe Ala His Arg
 500 505 510
 Gly Leu Gln
 515

<210> 31
 <211> 216
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 31
 Ala Ile Ile Leu Ile Arg Asp Lys Leu Ser Arg Ile Phe Ser Arg Gln
 1 5 10 15
 Ile Ser Gly Glu Gly Met Phe Gly Tyr Arg Ser Ala Ser Pro Lys Ile
 20 25 30
 Arg Phe Ile Thr Asp Arg Met Val Val Arg Leu Val Tyr Glu Arg Asp
 35 40 45
 Ala Tyr Arg Leu Ala Glu Tyr Tyr Ser Glu Asn Lys Asp Phe Leu Lys
 50 55 60
 Pro Trp Glu Pro Thr Arg Asp Gly Ser Phe Tyr Gln Pro Ser Gly Trp
 65 70 75 80
 Thr Asn Arg Leu Asn Tyr Ile Ala Glu Leu Gln Arg Gln Asn Ala Thr
 85 90 95
 Phe Asn Phe Val Leu Leu Asp Ser Asp Glu Arg Glu Ile Met Gly Val
 100 105 110
 Ala Asn Phe Thr Asn Val Val Arg Gly Ala Phe His Ser Cys Tyr Leu
 115 120 125
 Gly Tyr Ser Leu Ala Glu Lys Leu Gln Gly Gln Gly Leu Met Tyr Glu
 130 135 140
 Ala Leu Gln Pro Ala Ile Arg Tyr Met Gln Arg Tyr Gln Arg Met His
 145 150 155 160
 Arg Ile Met Ala Asn Tyr Met Pro His Asn His Arg Ser Gly Asn Leu
 165 170 175
 Leu Lys Lys Leu Gly Phe Glu Gln Glu Gly Tyr Ala Lys Asn Tyr Leu
 180 185 190
 Met Ile Asp Gly Val Trp Gln Asp His Val Leu Thr Ala Leu Thr Asp
 195 200 205
 Asp Ala Trp Gly Lys Val Gly Leu
 210 215

<210> 32
 <211> 404
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 32
 Trp Cys Ala Met Ser Leu Val Ser Gln Ala Arg Ser Leu Gly Lys Tyr
 1 5 10 15
 Phe Leu Leu Phe Asp Asn Leu Leu Val Val Leu Gly Phe Phe Val Val
 20 25 30
 Phe Pro Leu Ile Ser Ile Arg Phe Val Glu Gln Leu Gly Trp Ala Ala
 35 40 45
 Leu Ile Val Gly Phe Ala Leu Gly Leu Arg Gln Leu Val Gln Gln Gly
 50 55 60
 Leu Gly Ile Phe Gly Gly Ala Ile Ala Asp Arg Phe Gly Ala Lys Pro

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65 70 75 80
 Met Ile Val Thr Gly Met Leu Leu Arg Ala Leu Gly Phe Ala Leu Met
 85 90 95
 Ala Met Ala His Glu Pro Trp Ile Leu Leu Ser Cys Val Leu Ser
 100 105 110
 Gly Leu Gly Gly Thr Leu Phe Asp Pro Pro Arg Ala Ala Leu Val Ile
 115 120 125
 Lys Leu Thr Arg Pro His Glu Arg Gly Arg Phe Tyr Ser Ile Leu Met
 130 135 140
 Met Gln Asp Ser Ala Gly Ala Val Val Gly Ala Leu Ile Gly Ser Trp
 145 150 155 160
 Leu Leu Gln Tyr Asp Phe Asn Ile Val Cys Trp Ile Gly Ala Ser Ile
 165 170 175
 Phe Val Leu Ala Ala Leu Phe Asn Ala Trp Leu Leu Pro Ala Tyr Arg
 180 185 190
 Ile Ser Thr Ile Arg Thr Pro Ile Lys Glu Gly Met Met Arg Val Ile
 195 200 205
 Arg Asp Arg Arg Phe Leu Tyr Tyr Val Leu Thr Leu Thr Gly Tyr Phe
 210 215 220
 Val Leu Ser Val Gln Val Met Leu Met Phe Pro Ile Ile Ile His Glu
 225 230 235 240
 Ile Thr Gly Thr Pro Thr Ala Val Lys Trp Met Tyr Ala Ile Glu Thr
 245 250 255
 Ala Ile Ser Leu Thr Leu Leu Tyr Pro Ile Ala Arg Trp Ser Glu Lys
 260 265 270
 His Phe Arg Leu Glu Gln Arg Leu Met Ala Gly Leu Phe Leu Met Ser
 275 280 285
 Ile Cys Met Phe Pro Ile Gly Trp Val Asn Gln Leu His Thr Leu Phe
 290 295 300
 Gly Leu Leu Cys Leu Phe Tyr Leu Gly Leu Val Thr Ala Asp Pro Ala
 305 310 315 320
 Arg Glu Thr Leu Ser Ala Ser Leu Ser Asp Pro Arg Ala Arg Gly Ser
 325 330 335
 Tyr Met Gly Phe Ser Arg Leu Gly Leu Ala Leu Gly Gly Ala Ile Gly
 340 345 350
 Tyr Thr Gly Gly Gly Trp Leu Tyr Asp Thr Gly Arg Asp Leu Asn Met
 355 360 365
 Pro Gln Leu Pro Trp Ile Leu Leu Gly Leu Ser Gly Leu Ile Thr Ile
 370 375 380
 Tyr Ala Leu His Arg Gln Phe Asn Gln Lys Lys Ile Asp Pro Val Met
 385 390 395 400
 Leu Gly Arg His

<210> 33.

<211> 191

<212> PRT

<213> Xenorhabdus bovienii

<400> 33

Lys Gly Ala Asn Met Lys Arg Phe Phe Leu Gly Ala Ala Leu Val Leu
 1 5 10 15
 Val Gly Leu Val Ser Gly Cys Asp Gln Phe Lys Asp Phe Ser Ile Asn
 20 25 30
 Glu Gly Leu Met Asn Asp Tyr Leu Leu Lys Lys Val His Tyr Gln Lys
 35 40 45
 Lys Ile Ser Ile Pro Gly Ile Ala Asn Ala Asn Ile Thr Leu Gly Asp

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50		55		60
Leu Ser Ser Gln Ile Gly Arg Gln Asp Pro Glu Lys Ile Glu Leu Ser				
65		70		75
Thr Gln Ala Lys Val Gln Leu Ala Thr Leu Leu Gly Thr Ile Gln Ala				80
		85		90
Asp Met Lys Leu Thr Ile Lys Ala Lys Pro Val Phe Asp Ala Glu Lys				95
		100		105
Gly Ala Ile Phe Val Lys Gly Leu Glu Ile Val Asp Tyr Gln Thr Thr				110
		115		120
Pro Glu Lys Ala Ala Ala Pro Val Lys Ala Leu Ile Pro Tyr Leu Asn				125
		130		135
Thr Ser Leu Ser Glu Phe Phe Asp Thr His Pro Val Tyr Val Leu Asn				140
		145		150
Pro Glu Lys Ser Lys Ala Glu Ala Ala Ala Ser Gln Phe Ala Lys Arg				155
		165		170
Leu Glu Ile Lys Pro Gly Lys Leu Val Ile Gly Leu Thr Asp Lys				175
		180		185
				190

<210> 34
 <211> 205
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 34
Gln Val Ala Leu Gln His Gly Arg Arg Leu Gly Thr Ile Thr Leu Phe
1 5 10 15
Asp Asn Leu Leu Gly Leu Asn Gln Val Met Asn Glu Phe Ser Ile Val
20 25 30
Cys Arg Ile Leu Gly Thr Leu Phe Asn Arg Ala Pro Gln Asp Pro Val
35 40 45
Leu Gln Pro Leu Ile Thr Met Ile Ala Glu Gly Lys Leu Lys Gln Ala
50 55 60
Trp Pro Leu Glu Gln Asp Glu Trp Leu Asp Arg Leu Gln Gln Asn Ser
65 70 75 80
Glu Leu Ser Val Met Ala Ala Asp Tyr His Ala Leu Phe Thr Gly Glu
85 90 95
Ser Ala Ser Val Ala Val Cys Arg Ser Asp Tyr Thr Asp Gly Glu Glu
100 105 110
Ser Glu Val Arg Gln Phe Leu Thr Glu Arg Gly Met Pro Leu Ser Asp
115 120 125
Thr Pro Ala Asp Gln Phe Gly Ser Leu Leu Leu Ala Val Ser Trp Leu
130 135 140
Glu Asp Gln Ala Ala Glu Asp Glu Ile Gln Ala Gln Ile Thr Leu Phe
145 150 155 160
Asp Glu Tyr Leu Leu Pro Trp Cys Gly Gln Phe Leu Gly Lys Val Glu
165 170 175
Ala His Ala Thr Ser Gly Phe Tyr Arg Thr Leu Ala Ile Val Thr Arg
180 185 190
Glu Ala Leu Gln Ala Leu Arg Asp Glu Leu Glu Ser Glu
195 200 205

<210> 35
 <211> 315
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 35

His Asn Thr Asn Phe Arg Lys Ser Arg Asn Ser Thr Ile Arg Leu Cys
 85 90 95
 Ser Ser Thr Pro Asn Ser Lys Gln Tyr Phe Thr Thr Ser Arg Lys Cys
 100 105 110
 His Ile Thr Gly Ala Gly Lys Tyr Arg Phe Ser Ile Glu Asn Cys Phe
 115 120 125
 Ile Lys Ser Gly
 130

<210> 37
 <211> 289
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 37
 Tyr Ser Ala Gly Cys Ser Thr Val Leu Lys Ser Ser Leu Asn Leu Gln
 1 5 10 15
 Cys Asp Thr Phe Asn Cys Glu Ser Phe Val Met Leu Thr Leu Asn Phe
 20 25 30
 Ser Thr Ser Val Asn Ala Lys Pro Ser His Ile Trp Ala His Tyr Val
 35 40 45
 Asp Phe Asp Leu Arg Lys Lys Trp Glu Val Asp Leu Glu Tyr Phe Gln
 50 55 60
 Phe Glu Gly Glu Val Lys Thr Gly Gln Tyr Gly Arg Met Ile Leu Ser
 65 70 75 80
 Gly Met Pro Glu Ile Arg Phe Tyr Leu Ser Asn Ile Glu Val Asn Lys
 85 90 95
 Glu Phe Thr Asp Gln Val Asn Leu Pro Gln Met Gly Ile Leu Thr Phe
 100 105 110
 Arg His Gln Ile Ile Thr Asp Glu Asn Asn Met Ala Cys Arg Val Gln
 115 120 125
 Val Thr Val Ser Phe Glu Pro Asp Ala Asn Ile Pro Ala Val Gln Ala
 130 135 140
 Glu Ser Phe Phe Lys Gln Gly Thr Gln Asp Leu Val Glu Ser Val Leu
 145 150 155 160
 Arg Leu Lys Ser Val Val Glu Thr Val Ser Pro Lys Pro Asn Leu Gln
 165 170 175
 Leu Val Tyr Val Ser Asp Ile Glu Ser Ser Thr Ala Phe Tyr Lys Thr
 180 185 190
 Ile Phe Asn Ala Glu Pro Ile Phe Ala Ser Ser Arg Tyr Val Ala Phe
 195 200 205
 Pro Ala Gly Gly Glu Val Leu Phe Ala Ile Trp Ser Gly Gly Ala Lys
 210 215 220
 Pro Asp Arg Ala Ile Pro Arg Phe Ser Glu Ile Gly Ile Met Leu Pro
 225 230 235 240
 Ser Gly Lys Asp Val Asp Arg Cys Phe Glu Glu Trp Arg Lys Asn Pro
 245 250 255
 Glu Ile Lys Ile Val Gln Glu Pro His Thr Glu Val Phe Gly Arg Thr
 260 265 270
 Phe Leu Ala Glu Asp Pro Asp Gly His Ile Ile Arg Val Cys Pro Leu
 275 280 285
 Asp

<210> 38
 <211> 270
 <212> PRT

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<213> Xenorhabdus bovienii

<400> 38

Lys Gly Asn Gln Ile Thr Met Ile Leu Tyr Lys Gly Ser Lys Asn Tyr
 1 5 10 15
 Leu Phe Asn Gln Leu Asn Tyr Asp Ser Cys Val Leu Leu Glu Val Asp
 20 25 30
 Glu Ser Val Asn Leu Asn Gly Trp Asp Glu Leu Ser Arg Ala Gln Arg
 35 40 45
 Leu Leu Phe Leu Met Glu Ile Leu Arg Arg Tyr His Phe Pro Val Gln
 50 55 60
 Gly Lys Val Leu Ala Gln Lys Leu Asn Ile Ser Leu Arg Thr Leu Tyr
 65 70 75 80
 Arg Asp Ile Ala Ser Leu Gln Ala Gln Gly Ala Ile Ile Glu Gly Glu
 85 90 95
 Pro Gly Ile Gly Tyr Val Leu Arg Pro Gly Phe Val Leu Pro Pro Leu
 100 105 110
 Met Phe Thr Gln Asn Glu Ile Glu Ala Leu Ala Leu Gly Ala Asn Trp
 115 120 125
 Val Ala Lys Arg Ala Asp Pro Gln Leu Lys Glu Ser Ala Asn Asn Ala
 130 135 140
 Ile Ser Lys Ile Ala Ala Val Ile Pro Ala Glu Leu Lys Gln Met Leu
 145 150 155 160
 Glu Ala Ser Ser Leu Leu Ile Gly Pro Ala Ala Thr Ala Val Gln Pro
 165 170 175
 Val Val Glu Ile Gln Gln Ile Arg Gln Ala Ile Asn Thr Arg His Lys
 180 185 190
 Ile Thr Leu Ala Tyr Leu Asp Ile Lys Asp Ile Pro Ser Glu Arg Thr
 195 200 205
 Ile Trp Pro Phe Ala Leu Gly Tyr Phe Glu Asn Ile Ser Ile Val Ile
 210 215 220
 Gly Trp Cys Glu Leu Arg Glu Glu Phe Arg His Phe Arg Ser Asp Arg
 225 230 235 240
 Ile Met Arg Leu Lys Ile Glu Asn Gln Cys Tyr Pro Arg Ser Arg Gln
 245 250 255
 Val Leu Leu Lys Glu Trp Arg Ala Met Glu Lys Ile Ser Arg
 260 265 270

<210> 39

<211> 209

<212> PRT

<213> Xenorhabdus bovienii

<400> 39

Arg Lys Met Thr Ile Tyr Asp Leu Lys Pro Arg Phe Gln Asn Leu Leu
 1 5 10 15
 Arg Pro Ile Val Ile Tyr Leu Tyr Lys Gln Gly Ile Thr Ala Asn Gln
 20 25 30
 Val Thr Leu Thr Ala Leu Phe Leu Ser Ile Phe Ala Gly Ser Leu Leu
 35 40 45
 Ser Leu Phe Pro Ser Pro His Leu Tyr Trp Leu Leu Pro Val Phe Leu
 50 55 60
 Phe Ile Arg Met Ala Leu Asn Ala Ile Asp Gly Met Leu Ala Arg Glu
 65 70 75 80
 His Asn Gln Lys Ser His Leu Gly Ala Ile Tyr Asn Glu Leu Gly Asp
 85 90 95
 Val Ile Ser Asp Val Ala Leu Tyr Leu Pro Phe Cys Leu Leu Pro Asp

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			100					105				110			
Val	Asn	Ser	Leu	Ser	Leu	Leu	Ile	Ile	Leu	Phe	Leu	Thr	Ile	Leu	Thr
			115					120				125			
Glu	Phe	Ile	Gly	Val	Leu	Ala	Gln	Thr	Ile	Gly	Ala	Ser	Arg	Arg	Tyr
			130					135				140			
Asp	Gly	Pro	Ile	Gly	Lys	Ser	Asp	Arg	Ala	Phe	Ile	Phe	Gly	Ala	Tyr
145					150					155					160
Gly	Leu	Ile	Ile	Ala	Ile	Phe	Pro	Leu	Ala	Leu	Gly	Trp	Ser	Ile	Ser
				165						170					175
Leu	Phe	Ala	Phe	Met	Ile	Ile	Leu	Leu	Val	Thr	Cys	Tyr	Gln	Arg	
			180						185				190		
Val	Val	Lys	Ala	Leu	Arg	Glu	Ile	Arg	Leu	Ala	Glu	Gln	Ser	His	Ser
		195						200				205			
Lys															

<210> 40

<211> 592

<212> PRT

<213> Xenorhabdus bovienii

<400> 40

Gly	Val	Asn	Met	Thr	Pro	Gln	Leu	Asp	Gln	Arg	Ile	Ala	Glu	Glu	His
1				5					10					15	
Tyr	Phe	Thr	Thr	Ser	Asp	Asn	Ala	Ser	Leu	Phe	Tyr	Arg	Tyr	Trp	Pro
			20					25					30		
Gln	Gln	Gln	Ala	Asn	Pro	Asp	Arg	Ala	Ile	Ile	Ile	Phe	His	Arg	Gly
		35					40					45			
His	Glu	His	Ser	Gly	Arg	Ile	Gln	His	Val	Val	Asp	Gly	Leu	Asp	Leu
50						55					60				
Pro	Asp	Val	Pro	Met	Phe	Ala	Trp	Asp	Ala	Arg	Gly	His	Gly	Lys	Thr
65					70					75					80
Glu	Gly	Pro	Arg	Gly	Tyr	Ser	Pro	Ser	Met	Gly	Thr	Ser	Ile	Arg	Asp
				85					90					95	
Val	Asp	Glu	Phe	Val	Arg	Phe	Ile	Ala	Thr	Gln	Tyr	Gly	Ile	Ala	Met
			100					105					110		
Glu	Asn	Ile	Val	Val	Ile	Gly	Gln	Ser	Val	Gly	Ala	Val	Leu	Val	Ser
		115					120					125			
Ala	Trp	Val	His	Asp	Tyr	Ala	Pro	Lys	Ile	Arg	Ala	Met	Ile	Leu	Ala
		130				135					140				
Ala	Pro	Ala	Phe	Asp	Ile	Lys	Leu	Tyr	Ile	Pro	Phe	Ala	Thr	Gln	Gly
145					150					155					160
Leu	Gln	Leu	Met	Gln	Lys	Ala	Arg	Gly	Ile	Phe	Phe	Val	Asn	Ser	Tyr
			165						170					175	
Val	Lys	Ala	Arg	Tyr	Leu	Thr	His	Asp	Glu	Thr	Arg	Ile	Ala	Ser	Tyr
			180					185					190		
Asn	Ser	Asp	Pro	Leu	Ile	Thr	Arg	Glu	Ile	Ala	Val	Asn	Ile	Leu	Leu
		195					200					205			
Asp	Leu	Tyr	Gln	Thr	Ala	Glu	Arg	Val	Val	Lys	Asp	Ala	Ala	Ala	Ile
	210					215					220				
Thr	Leu	Pro	Thr	Leu	Leu	Phe	Ile	Ser	Gly	Ser	Asp	Tyr	Val	Val	Asn
225					230					235					240
Lys	Lys	Pro	Gln	His	Gln	Phe	Tyr	Gln	Gln	Leu	Asn	Thr	Pro	Ile	Lys
				245					250					255	
Glu	Lys	His	Val	Met	Asp	Gly	Phe	Tyr	His	Asp	Thr	Leu	Gly	Glu	Lys
			260					265					270		
Asp	Arg	His	Leu	Val	Phe	Asp	Lys	Ile	Arg	Val	Phe	Ile	Glu	Arg	Ile

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275 280 285
 Phe Ala Leu Pro Arg Tyr Gln His Asp Tyr Ser Gln Glu Asp Thr Trp
 290 295 300
 Ser His Ser Ala Asp Glu Phe Arg Thr Leu Ser Thr Ser Leu Pro Cys
 305 310 315 320
 Leu Cys Pro Lys Lys Leu Ser Tyr Gln Leu Met Arg Lys Val Met Ser
 325 330 335
 Thr His Trp Gly Arg Thr Ser Glu Gly Val Cys Ile Gly Leu Lys Thr
 340 345 350
 Gly Phe Asp Ser Gly Ser Thr Leu Asp Tyr Val Tyr Arg Asn Gln Pro
 355 360 365
 Gln Gly Lys Gly Ile Leu Gly Arg Ile Leu Asp Lys His Tyr Leu Asn
 370 375 380
 Ser Ile Gly Trp Arg Gly Ile Arg Gln Arg Lys Ile His Ile Glu Met
 385 390 395 400
 Leu Ile Arg His Ala Ile Arg Ser Leu Arg Glu Gln Asn Met Pro Val
 405 410 415
 His Met Val Asp Ile Ala Ala Gly His Gly Arg Tyr Ile Leu Asp Ala
 420 425 430
 Ile Asn Asp Phe Ser Lys Val Asp Ser Ile Leu Leu Arg Asp Tyr Ser
 435 440 445
 Glu Ile Asn Val Asn Gln Gly Gln Ala Tyr Ile Glu Glu Arg Asp Leu
 450 455 460
 Thr Asp Lys Ile Arg Phe Ile Ile Gly Asp Ala Phe Asn Ala Glu Ser
 465 470 475 480
 Ile Ser Ser Ile Thr Pro Ala Pro Thr Leu Gly Ile Val Ser Gly Leu
 485 490 495
 Tyr Glu Leu Phe Pro Asp Asn Asn Leu Leu Arg Asn Ser Leu Arg Gly
 500 505 510
 Phe Ala Asp Val Met Thr Glu Asn Gly Tyr Leu Val Tyr Thr Gly Gln
 515 520 525
 Pro Trp His Pro Gln Ile Glu Val Ile Ala Arg Val Leu Ser Ser His
 530 535 540
 Arg Asp Ser Gln Pro Trp Ile Met Arg Arg Arg Thr Gln Gly Glu Met
 545 550 555 560
 Asp Ala Leu Val Glu Ala Ala Gly Phe Glu Lys Leu Tyr Gln Leu Thr
 565 570 575
 Asp Asn Trp Gly Ile Phe Thr Val Ser Ile Ala Lys Arg Val His Arg
 580 585 590

<210> 41

<211> 121

<212> PRT

<213> Xenorhabdus bovienii

<400> 41

His His Asn Ser Ile Asn Val Leu Leu Lys Asn Ile Ile Ser Pro His
 1 5 10 15
 Gln Ile Met Leu Leu Cys Phe Thr Val Thr Gly His Asn Asn Arg Pro
 20 25 30
 Ile Gln Thr Glu Arg Ser Leu Phe Phe Thr Val Val Met Ser Thr Gln
 35 40 45
 Asp Val Ser Ser Met Ser Leu Thr Asp Ser Ile Cys Leu Met Phe Leu
 50 55 60
 Cys Ser Arg Gly Met Pro Val Asp Thr Val Arg Gln Lys Gly Arg Ala
 65 70 75 80
 Val Thr Ala His Pro Trp Glu Arg Arg Phe Val Met Leu Met Asn Leu

				85					90					95			
Ser	Asp	Leu	Leu	Pro	Leu	Ser	Thr	Ala	Ser	Pro	Trp	Lys	Ile	Ser	Trp		
			100					105					110				
Leu	Ser	Ala	Arg	Val	Ser	Glu	Arg	Tyr									
		115					120										

<210> 42
 <211> 444
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 42

Ile	Asn	Lys	Tyr	Lys	Met	Glu	His	His	Met	His	Ser	Ser	Leu	Asp	Ser		
1				5					10					15			
Arg	Arg	Arg	Leu	Trp	Leu	Thr	Gly	Val	Ile	Trp	Leu	Leu	Phe	Leu	Ala		
			20					25					30				
Pro	Phe	Phe	Phe	Leu	Thr	Tyr	Gly	Gln	Val	Asn	Gln	Phe	Thr	Ala	Gln		
		35					40					45					
Arg	Ser	Asp	Val	Gly	Thr	Val	Met	Phe	Gly	Trp	Glu	His	Asn	Ile	Pro		
	50					55					60						
Phe	Trp	Ser	Trp	Ser	Ile	Ile	Pro	Tyr	Trp	Ser	Ile	Asp	Leu	Phe	Tyr		
65					70					75					80		
Gly	Ile	Ser	Leu	Phe	Ile	Cys	Thr	His	Arg	Arg	Glu	Gln	Trp	Leu	His		
				85					90					95			
Gly	Trp	Arg	Leu	Met	Thr	Ala	Ser	Leu	Ile	Ala	Cys	Val	Gly	Phe	Leu		
			100					105					110				
Leu	Phe	Pro	Leu	Lys	Phe	Ser	Phe	Ser	Arg	Pro	Thr	Thr	Glu	Gly	Leu		
		115					120					125					
Phe	Gly	Trp	Leu	Phe	Asn	Gln	Leu	Glu	Leu	Phe	Asp	Leu	Pro	Tyr	Asn		
	130					135					140						
Gln	Ala	Pro	Ser	Leu	His	Ile	Ile	Leu	Leu	Trp	Leu	Leu	Trp	Leu	Arg		
145				150						155					160		
Tyr	Ser	Ala	Tyr	Val	Ser	Gly	Tyr	Trp	Arg	Gly	Leu	Leu	His	Ile	Trp		
			165						170					175			
Ser	Val	Leu	Ile	Ala	Leu	Ser	Val	Leu	Thr	Thr	Trp	Gln	His	His	Phe		
		180						185					190				
Ile	Asp	Val	Leu	Thr	Gly	Phe	Ala	Val	Gly	Val	Ile	Leu	Ser	Tyr	Leu		
	195					200						205					
Leu	Pro	Val	Ser	Tyr	Arg	Trp	Arg	Trp	Gln	Pro	Asn	Gln	Asp	Arg	Tyr		
	210					215					220						
Ala	Arg	Lys	Leu	Phe	Gly	Tyr	Tyr	Leu	Thr	Gly	Ser	Ala	Leu	Phe	Ala		
225					230					235					240		
Leu	Ile	Ala	Ser	Leu	Leu	Gly	Gly	Ser	Phe	Trp	Ile	Leu	Leu	Trp	Pro		
				245					250					255			
Ala	Val	Ser	Leu	Leu	Met	Ile	Ala	Leu	Gly	Tyr	Ala	Gly	Leu	Gly	Ser		
		260						265					270				
Ser	Val	Phe	Gln	Lys	Gln	Pro	Asp	Gly	Arg	Met	Ser	Leu	Ser	Ala	Arg		
	275						280					285					
Trp	Leu	Ala	Pro	Tyr	Gln	Leu	Gly	Ala	Trp	Leu	Ser	Tyr	Leu	Trp			
	290				295					300							
Phe	Arg	Arg	Lys	Ser	Ala	Pro	Phe	Asn	His	Ile	Thr	Glu	Gly	Ile	Ile		
305				310					315						320		
Leu	Gly	Ser	Leu	Pro	Cys	Gln	Pro	Val	Thr	Ala	Val	Ser	Val	Leu	Asp		
				325					330					335			
Ile	Thr	Ala	Glu	Trp	His	Arg	Arg	Ser	Asp	Ala	Arg	Thr	Val	Asn	Tyr		
		340						345					350				
Val	Cys	Gln	Pro	Gln	Ile	Asp	Leu	Leu	Pro	Leu	Ala	Pro	Glu	Ala	Leu		

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355 360 365
 Gln Ser Ala Val Cys Thr Leu Asp Lys Leu Arg Gln Gln Gly Asp Val
 370 375 380
 Phe Val His Cys Thr Leu Gly Leu Ser Arg Ser Ala Met Val Val Ala
 385 390 395 400
 Ala Trp Leu Leu Lys Gln His Pro Glu Tyr Asp Ile Asn Thr Val Val
 405 410 415
 Ala Ile Leu Arg Lys Ala Arg Pro His Val Thr Phe Arg Gln Thr His
 420 425 430
 Leu Asp Ala Leu Ser Gln Trp Ala Lys Gly Tyr Leu
 435 440

<210> 43
 <211> 174
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 43
 Gln Ser Cys Val Lys Pro Asp Arg Met Ser Arg Ser Asp Lys His Ile
 1 5 10 15
 Trp Met Pro Cys Leu Asn Gly Gln Lys Ala Thr Tyr Asn Gly Glu His
 20 25 30
 Asn Met Gln Pro Glu Asn Leu Ile Ser Lys Val Ile Ile Ala Thr Leu
 35 40 45
 Lys Ser Trp Arg Phe Ile Ser Thr Leu Ser Ala Phe Ser Ile Leu Ile
 50 55 60
 Ala Thr Ala Met Leu Ile Ala Val Phe Asn Thr Thr Ala Leu Asn Asn
 65 70 75 80
 Ile Ala Leu Tyr Ala Val Leu Leu Phe Thr Thr Leu Tyr Cys Gln Tyr
 85 90 95
 Tyr Cys Trp Arg Thr Trp Leu Asp Cys His Tyr Phe Gln Ile Leu Asn
 100 105 110
 Ser Ser Pro Glu Lys Ser Ala Glu Phe Asp Gln Thr Leu Leu Leu Ile
 115 120 125
 Phe Asn Lys Leu Pro Gln Ser Arg Thr Gln Asn Asp Arg Phe Asn Gly
 130 135 140
 Ala Ile Lys Leu Leu Lys Lys Ala Thr Ile Gly Leu Ile Leu Gln Trp
 145 150 155 160
 Ile Leu Phe Phe Leu Phe Leu Leu Thr Leu Lys Tyr Ser Ala
 165 170

<210> 44
 <211> 466
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 44
 Met Asn Thr Arg Lys Ile Asn Gly Ile Arg Pro Phe Ser Ala Phe Ile
 1 5 10 15
 Asp Ser Cys Leu Lys Glu Ser Tyr Ser Phe Pro Arg Phe Ile Arg Asp
 20 25 30
 Ile Ile Ala Gly Ile Thr Val Gly Val Ile Ala Ile Pro Leu Ala Met
 35 40 45
 Ala Leu Ala Ile Gly Ser Gly Val Ala Pro Gln Tyr Gly Leu Tyr Thr
 50 55 60
 Ala Ala Ile Ala Gly Ile Val Ile Ala Met Thr Gly Gly Ser Arg Tyr
 65 70 75 80

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<210> 45
<211> 125
<212> PRT
<213> Xenorhabdus bovienii
<400> 45
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Glu Ser Ile Gly Ala Lys Thr Ser Asn Val Asn Asn Thr Ser Arg Glu
 1 5 10 15
 Cys Thr Thr Ala Ala Ile Gly Glu Val Ala Pro Ala Arg Thr Leu Ala
 20 25 30
 Ala Glu Arg Ala Ile Ala Ala Val Ala Val Met Pro Pro Lys Lys Gly
 35 40 45
 Ala Ala Ile Leu Pro Asn Pro Trp Pro Ser Ser Ser Pro Leu Glu Trp
 50 55 60
 Cys Phe Phe Pro Val Ile Pro Ser Arg Ile Thr Ala His Ser Asn Asp
 65 70 75 80
 Ser Ile Ala Pro Ser Met Ala Ile Glu Asn Ala Ala Gly Ser Asn Ala
 85 90 95
 Asp Thr Val Phe Gln Leu Ile Ser Arg Glu Cys Val Ser Gly Lys Phe
 100 105 110
 His Gly Arg Thr Asn Trp Gly Arg Met Gly Gly Met Pro
 115 120 125

<210> 46
 <211> 161
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 46
 Leu Ser Tyr Ser Ile Trp Ser Val Ala Ile Thr Ile Gly Ile Val Leu
 1 5 10 15
 Ala Ser Leu Leu Phe Met Arg Lys Ile Ala Asn Met Thr Arg Ile Ser
 20 25 30
 Thr Ser Ser Leu Thr Ser Ala Glu Lys Gly Leu Leu Val Val Arg Ile
 35 40 45
 Asn Gly Pro Leu Phe Phe Ala Ala Glu Arg Ile Phe Ala Glu Leu
 50 55 60
 Arg Glu Lys Ser Ala Asp Tyr Gln Thr Ile Ile Met Gln Trp Asp Ala
 65 70 75 80
 Val Pro Val Leu Asp Ala Gly Gly Leu His Ala Phe Gln Gly Phe Val
 85 90 95
 Arg Glu Leu Gly Lys Glu Lys His Ile Val Val Cys Asp Ile Pro Phe
 100 105 110
 Gln Pro Leu Lys Thr Leu Ala Arg Ala Lys Val Met Pro Ile Glu Gly
 115 120 125
 Glu Leu Ser Phe Tyr Ala Thr Leu Pro Lys Ala Leu Lys Glu Met Ala
 130 135 140
 Val Asp Tyr Thr Pro Glu Val Cys Ala Ser Ser Glu Lys Ile Gln Gly
 145 150 155 160
 Gln

<210> 47
 <211> 173
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 47
 Cys Met Ser Asp Val Glu Asn Asp Arg Arg Thr Leu Gly Ser Leu Leu
 1 5 10 15
 His Asp Thr Glu Ala Gln His Val Asn His Gln Ile Val Ile Thr Lys
 20 25 30
 Val Ala Ala Thr Val Thr Gln Asp His Leu Val Ile Ala Ala Phe Phe

		35				40				45						
Glu	Phe	Phe	Asn	Asn	Ile	Ala	His	Leu	Pro	Arg	Ala	Asn	Lys	Leu	Trp	
	50					55					60					
Phe	Phe	Asn	Ile	Asn	His	Ser	Thr	Gly	Phe	Arg	His	Arg	Phe	Asn	Gln	
65					70					75					80	
Ile	Gly	Leu	Ala	Gly	Lys	Glu	Gly	Trp	Lys	Leu	Asn	His	Ile	His	His	
				85					90					95		
Ile	Arg	Asp	Trp	Leu	Ser	Leu	Cys	Arg	Leu	Met	His	Val	Ser	Asp	Asn	
			100					105					110			
Phe	His	Ala	Glu	Gly	Leu	Phe	Gln	Phe	Leu	Lys	Asp	Phe	His	Pro	Leu	
		115					120					125				
Phe	Gln	Pro	Trp	Pro	Thr	Ile	Arg	Ala	Asp	Arg	Arg	Thr	Val	Ser	Leu	
		130				135					140					
Ile	Lys	Arg	Arg	Phe	Lys	Asn	Ile	Arg	Asn	Ala	Gln	Phe	Leu	Cys	His	
145					150					155					160	
Gly	Asp	Ile	Val	Leu	Thr	Asn	Pro	His	Gly	Gln	Ile	Pro				
				165					170							

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<210> 48
<211> 308
<212> PRT
<213> Xenorhabdus bovienii
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<400> 48															
Leu 1	Ser	Cys	Ile	Arg 5	Phe	Ile	Phe	Leu	Leu 10	Ile	Gln	Gln	Ile	Tyr 15	Leu
Pro	Leu	Thr	Arg 20	Glu	Gly	Ile	Ser	Met 25	Gln	Gln	Lys	Val	Val 30	Asn	Ile
Gly	Asp	Ile 35	Lys	Val	Ala	Asn 40	Asp	Leu	Pro	Phe	Val	Leu 45	Phe	Gly	Gly
Met	Asn 50	Val	Leu	Glu	Ser	Arg 55	Asp	Leu	Ala	Met	Arg 60	Ile	Cys	Glu	His
Tyr 65	Val	Thr	Val	Thr	Gln 70	Lys	Leu	Gly	Ile	Pro 75	Tyr	Val	Phe	Lys	Ala 80
Ser	Phe	Asp	Lys 85	Ala	Asn	Arg	Ser	Ser 90	Ile	Arg	Ser	Tyr	Arg	Gly 95	Pro
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